

## Eck Industries, Inc. Realizes Savings Through Smarter Lighting Solutions

*Working with Wisconsin's Focus on Energy, Eck Industries, Inc. pursued a lighting retrofit project that reduced its facility's electricity use, achieved annual operating savings, and provided higher quality lighting*

When Eck Industries, Inc. made the decision to advance its energy efficiency efforts, the company took stock of the resources made available to industry through Wisconsin's Focus on Energy program—a state-based organization that provides technical and financial resources for energy efficiency projects. Eck Industries, Inc. worked with Focus on Energy to plan a lighting retrofit project that would replace all of the high pressure sodium (HPS) fixtures installed in its facility with T8 fluorescent bulbs. Eck Industries, Inc. also received a rebate from Focus on Energy upon completion of the project, which helped mitigate investment costs. The lighting efficiency improvements proved to be a huge success—the new bulbs reduced the energy intensity of the facility's lighting by 46%, the project paid for itself in approximately 8 months, and the company realized annual operating savings of more than \$55,581. In order for Eck Industries, Inc. to realize the same savings in terms of profits, it would need to generate \$1,389,525 in sales (the pre-tax profit margin in the foundry industry is 4%).

### The Company

Established in 1948 by G.E. William Eck and outside investors, Eck Industries, Inc. was developed in a 7,200-square-foot garage building. In 1975, the company became a family-owned business after buying out the other investors. Today, Eck Industries, Inc. has more than 62 years of experience in the aluminum foundry business.<sup>1</sup> Located in Manitowoc, Wisconsin, the company employs approximately 250 people and has a 200,000-square-foot manufacturing facility.

Eck Industries, Inc. utilizes a wide range of aluminum alloys to produce a variety of castings, such as aircraft cylinder heads, marine parts, military equipment, and specialty car parts. The foundry utilizes a variety of casting methods where 50% of production uses dry sand, 30% green sand, and 20% permanent mold. Although the two major alloys used for production are A356 and A206, the foundry pours 30 different alloys. Dedicated to providing its customers with high-quality products, Eck Industries, Inc. is committed to maintaining and improving its status as a world-class producer of aluminum castings.



Eck Industries, Inc.'s manufacturing facility before the lighting retrofit.

Eck Industries, Inc.'s manufacturing facility after the lighting retrofit.

### The Energy Situation

One commonality among manufacturing facilities across different industries is the need to illuminate production areas. Investing in energy efficient lighting technology represents a simple but significant opportunity for companies to do so while reducing energy and operating costs. To this day, however, a number of companies are not pursuing energy savings associated with upgrading lighting equipment, in spite of substantial short-term financial benefits. This inaction is due to a number of factors, such as being unaware that more efficient lighting technologies are available, not having the technical expertise to implement the upgrades, lacking the working capital needed to cover the initial investment, and/or an inability to project how quickly initial investments can be paid back through operational savings.

In order to overcome these barriers, some companies are working with state organizations, vendors, and suppliers that can provide the technical expertise and financial resources to help plan and implement energy efficiency projects. This is the approach Eck Industries, Inc. took when it decided to pursue a full-scale lighting retrofit of its facility.

Eck Industries, Inc. had approximately 360 HPS fixtures installed throughout its 200,000-square-foot of manufacturing space. The electricity requirements to light this facility were substantial. Working with Wisconsin's Focus on Energy, a state-funded organization that provides technical resources and financial incentives for energy efficiency projects, the company identified and acted on an opportunity to reduce the electricity use of its facility by replacing all of the current light fixtures with energy efficient T8 fluorescent light bulbs, which use about half as much energy as the HPS fixtures.

Focus on Energy worked with Eck Industries, Inc. to perform tests that helped determine the most suitable fixtures for the company's lighting upgrade. Test results suggested that the

company's best option was to install 360 T8 6- and 4-bulb fixtures throughout its plant. To ensure the most appropriate fixture type was used in each area of the facility, the company worked with light fixture provider Orion Energy. It was determined that three different types of fixtures would be used in the upgrade: enclosed and gasketed watertight luminaires (\$225 each); 6-bulb fixtures (\$125 each); and 4-bulb fixtures (\$110 each). Fixtures were mounted between 10–25 feet, depending on the location in the plant.

Altogether, Eck Industries, Inc. spent \$70,000 on the retrofit—\$60,000 on the fixtures and \$10,000 on their installation. However, Wisconsin's Focus on Energy helped mitigate the project's cost by providing Eck Industries, Inc. with a \$33,615 energy rebate, which equates to roughly 48% of the cost to purchase and install the equipment.<sup>3</sup>

Furthermore, in addition to the lighting upgrade, the company also installed motion sensors in low-traffic aisle ways and trained its employees to turn off portions of the lights when certain areas were not being used, which further increased energy savings.<sup>4</sup>

## Energy Efficiency Impacts

The Eck Industries, Inc. lighting retrofit project was a huge success. Not only did it provide higher quality lighting in the facility, but the new fixtures also reduced the facility's annual electricity usage for lighting by 674,923 kilowatt hours (kWh), which equates to 13,498,460 kWh over the fixture's 20-year lifespan. These energy savings translate to an estimated reduction of 443 tons of carbon dioxide per year, 2 tons of sulfur dioxide per year, and 1 ton of nitrogen oxide per year.<sup>5</sup> Additionally, the financial benefits of the energy savings were substantial. The company estimates the savings of the lighting conversion to be \$55,581 per year, which provides Eck Industries, Inc. with a return on investment of about 8 months (with the rebate).

Furthermore, the training the company provided its employees on how to power down unutilized lighting sections, as well as the installation of motion detectors, leads Eck Industries, Inc. to believe that the above energy savings on the new lighting fixtures are conservative. In short, the project reduced the energy intensity of the facility's lighting by 46%, paid for itself in approximately 8 months, and provided annual operating savings of more than \$55,581.<sup>6</sup>

## Conclusion

Eck Industries, Inc. recognized and acted on a simple, but significant opportunity that is worthy of consideration by any industrial plant that is using HPS lighting. The lighting retrofit project improved the lighting conditions of the company's

## High Pressure Sodium (HPS) Lighting

Classified as "high intensity discharge" lighting, HPS light bulbs produce a golden hue. They are used in 90% of the nation's roadway light fixtures, and are also commonly used in industrial workspaces and for outdoor floodlights. In spite of their popularity, which began in the 1960's, recent research suggests that HPS lighting is not an appropriate lighting type for indoor applications. Not only do HPS light bulbs use more electricity than alternatives, such as florescent lighting, but their golden hue has been cited for providing poor color rendition, limiting one's ability to see blue colors, which leads to lower visibility than blue-source lighting. Florescent lighting fixtures, on the other hand, provide a full spectrum of visibility because they enable blue color rendition and are much more energy efficient. Such improvements in lighting technology have led to a reassessment of the value of HPS lighting for indoor applications.<sup>2</sup>

facility and resulted in considerable energy and cost savings. Although achieving greater energy efficiency through lighting retrofits is just one of many methods companies can employ to decrease operational costs, Eck Industries, Inc. is a case-in-point of how a large industrial facility can successfully leverage state resources—both technical and financial—to overcome barriers to implementing large-scale energy efficiency projects.

## Endnotes

- <sup>1</sup> Eck Industries, Inc., "Profile," <http://www.eckindustries.com/profile2.htm>. Accessed October 20, 2010.
- <sup>2</sup> Light Corporation, Whitepaper, "Seeing is Believing: HPS Lighting," <http://www.lightcorp.com/indwhitepaper.cfm?id=6>. Accessed October 21, 2010.
- <sup>3</sup> Tyler W. Eck, Manufacturing Engineer, Eck Industries, Inc. August 2010.
- <sup>4</sup> Ibid.
- <sup>5</sup> Ibid.
- <sup>6</sup> Ibid.